

(1). $5x + 3 = 8 - 2x$.

$5x + 2x + 3 = 8$.

$7x = 8 - 3$

$7x = 5$

$x = \frac{5}{7}$

(2) $3x - 12 = 3(x - 3)$.

$3x - 12 = 3x - 9$.

$-12 = -9$. but $-12 \neq -9$, contradiction.

No solution.

(3). $4(x + 5) = -3x + 7(x + 2) + 6$.

$4x + 20 = -3x + 7x + 14 + 6$.

$4x + 20 = 4x + 20$.

True statement so everything works.

(4) $\frac{x}{5} - 3 = \frac{x}{3} + 1$.

LCM = 15 $\left(\frac{15}{5}\right)\left(\frac{x}{5}\right) - 3 \cdot 15 = \left(\frac{x}{3}\right)\left(\frac{15}{1}\right) + 1 \cdot 15$.

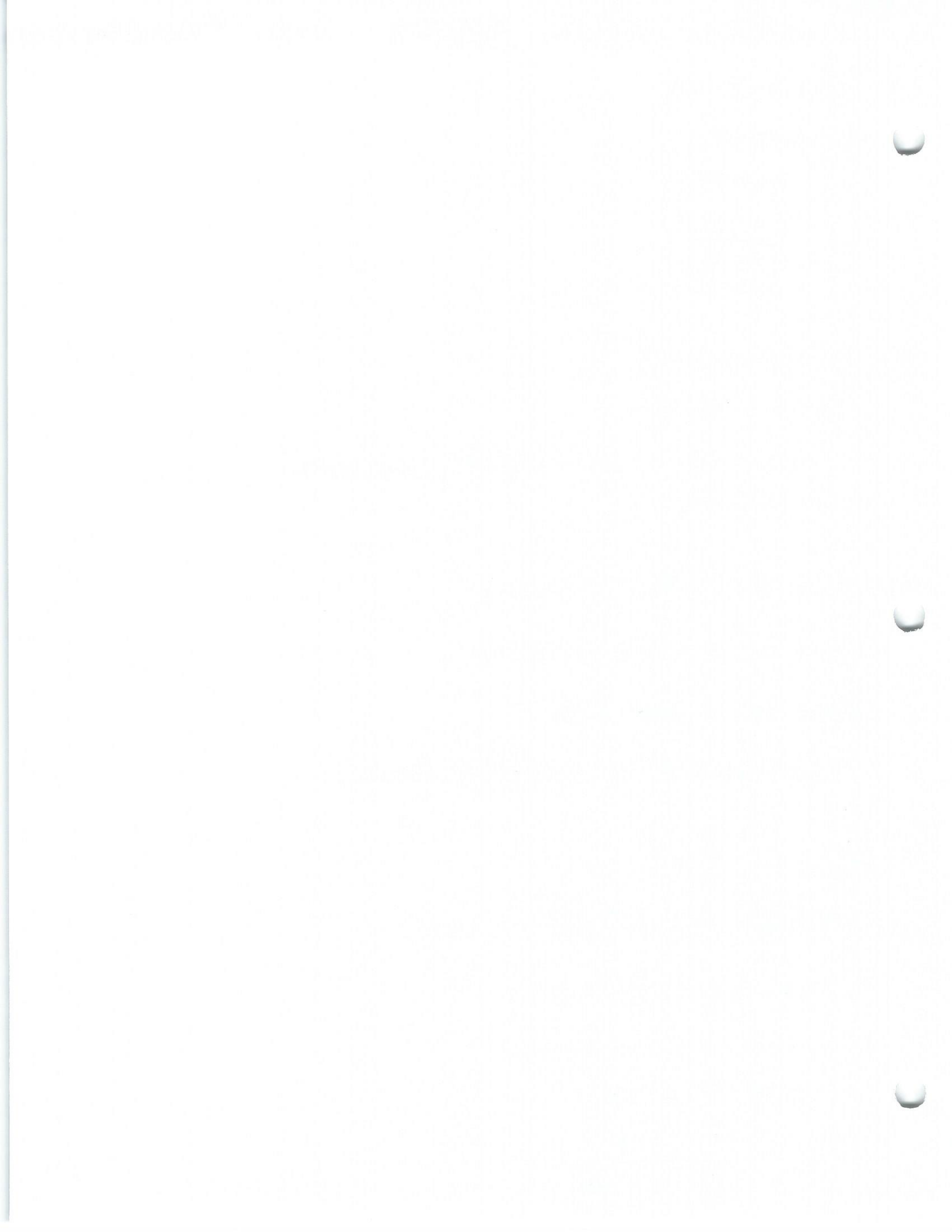
$3x - 45 = 5x + 15$.

$-45 = 5x - 3x + 15$.

$-45 - 15 = 2x$.

$-60 = 2x$

$x = -30$



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1. $3x - 7 = x + 3$

$$3x - x - 7 = 3$$

$$2x = 3 + 7$$

$$2x = 10$$

$$\boxed{x = 5}$$

5

2. $5 - 2x = 4x + 17$

$$5 - 17 - 2x = 4x$$

$$-12 = 4x + 2x$$

$$-12 = 6x$$

$$\boxed{-2 = x}$$

-2

3. $10x + 3 = 6(x + 2) + 4x$

$$10x + 3 = 6x + 12 + 4x$$

$$10x + 3 = 10x + 12$$

$$3 = 12$$

But $3 \neq 12$, so this is a contradiction

Therefore no solution.

no solution.

4. $2(3x + 12) = 6(x + 4)$

$$6x + 24 = 6x + 24$$

This is a true statement

So the answer is all real numbers.

all real numbers

$$5) \frac{x}{2} + 4 = 13 - \frac{x}{4} \quad \text{LCM} = 4.$$

12

$$\frac{x}{2} \cdot \frac{4}{4} + (4)(4) = (13)(4) - \frac{x}{4} \cdot \frac{4}{1}$$

$$2x + 16 = 52 - x$$

$$2x + x + 16 = 52$$

$$3x = 52 - 16$$

$$3x = 36$$

$$\Rightarrow \boxed{x = 12}$$

$$6) \frac{5-x}{2x+22} = \frac{5}{6}$$

-5

$$6(5-x) = 5(2x+22)$$

$$30 - 6x = 10x + 110$$

$$30 - 110 - 6x = 10x$$

$$-90 = 10x + 6x$$

$$-90 = 16x \quad \Rightarrow \boxed{-5 = x}$$

$$7) 5 - \frac{x}{2} = \frac{x}{3} + 10$$

LCM = 6

$$(5)(6) - \frac{x}{2} \cdot \frac{6}{1} = \frac{x}{3} \cdot \frac{6}{1} + (10)(6)$$

$$30 - 3x = 2x + 60$$

$$30 - 3x - 2x = 60$$

$$-5x = 60 - 30$$

$$-5x = 30 \quad \Rightarrow \boxed{x = -6}$$

$$8) 7x - 6 = 2 + 3x + 2(2x - 4)$$

All real numbers

$$7x - 6 = 2 + 3x + 4x - 8$$

$$7x - 6 = 7x - 6$$

true statement

Solution can be the set of all real numbers